

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 2 of 21

Docket: 020101

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A method to retrieve elevation data, the method comprising:
 locating a first compressed portion of a Digital Elevation Model (DEM) using a first index, the Digital Elevation Model comprising a plurality of compressed portions which are portions of compressed profiles in a first tile of the Digital Elevation Model, the compressed portions stored in one of: a Memory Mapped File (MMF), Random Access Memory (RAM), and a file in a file system on a digital processing system, the plurality of compressed portions including which includes the first compressed portion, the first index pointing to a storage location where the first compressed portion is stored; [[and]]
 decompressing the first compressed portion to retrieve first elevation data for at least one sample point in the Digital Elevation Model;
 identifying the first tile, the first tile containing a first location and being one of a plurality of tiles in an area of the Digital Elevation Model; and
 identifying a first profile that is in the vicinity of the first location, the first compressed portion being a portion of the first profile.
2. (withdrawn) A method as in claim 1 wherein the plurality of compressed portions are stored in one of:
 - a) a Memory Mapped File (MMF);
 - b) Random Access Memory (RAM); and
 - c) a file in a file system on a digital processing system.

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 3 of 21

Docket: 020101

3. (withdrawn) A method as in claim 2 wherein the plurality of compressed portions are portions of compressed profiles in a first tile of the Digital Elevation Model.
4. (withdrawn) A method as in claim 3 further comprising:
 - identifying the first tile, the first tile containing a first location and being one of a plurality of tiles in an area of the Digital Elevation Model; and
 - identifying a first profile that is in the vicinity of the first location, the first compressed portion being a portion of the first profile.
5. (withdrawn) A method as in claim 4 further comprising:
 - identifying the area, the area containing the first location and being one of a plurality of areas of the Digital Elevation Model.
6. (original) A method as in claim 1 wherein said decompressing the first compressed portion comprises:
 - run length decoding the first compressed portion to generate scaled elevation data;
 - inverse scaling the scaled elevation data to generate normalized elevation data;
 - and
 - adding a reference elevation to the normalized elevation data to generate the first elevation data.
7. (original) A method as in claim 1 further comprising:
 - identifying a plurality of sample points in the vicinity of a first location;
 - retrieving elevations of the plurality of sample points from the Digital Elevation Model; and
 - computing an elevation of the first location from an interpolation using the elevations of the plurality of sample points.

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 4 of 21

Docket: 020101

8. (original) A method as in claim 7 further comprising:
performing a coordinate transformation to express a horizontal position of the first location in a coordinate system used by the Digital Elevation Model.
9. (original) A method as in claim 7 further comprising:
providing the elevation of the first location to a Position Determination Entity to perform altitude aiding in a positioning system.
10. (original) A method as in claim 9 wherein said computing the elevation of the first location comprises:
performing a coordinate transformation such that the elevation of first location is expressed in a coordinate system used by the Position Determination Entity.
11. (withdrawn) A method to store elevation data, the method comprising:
compressing elevation data of a first portion of a Digital Elevation Model (DEM) to generate first compressed elevation data;
storing the first compressed elevation data in a storage location pointed to by a first index; and
storing the first index.
12. (withdrawn) A method as in claim 11 further comprising:
storing parameters required for determining whether or not a location is in the first portion of the Digital Elevation Model.

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 5 of 21

Docket: 020101

13. (withdrawn) A method as in claim 11 further comprising:
storing data specifying a coordinate system used to represent the elevation data
of the first portion of the Digital Elevation Model.
14. (withdrawn) A method as in claim 11 wherein said compressing the elevation data
of the first portion comprises:
subtracting a reference elevation from the elevation data of the first portion of
the Digital Elevation Model (DEM) to generate normalized elevation
data; and
scaling the normalized elevation data to generate scaled elevation data.
15. (withdrawn) A method as in claim 14 wherein said compressing the elevation data
of the first portion further comprises:
run length encoding the scaled elevation data to generate the first compressed
elevation data.
16. (withdrawn) A method as in claim 11 wherein the first portion is a profile of the
Digital Elevation Model.
17. (withdrawn) A method as in claim 11 further comprising:
dividing an area of the Digital Elevation Model into a plurality of tiles; and
storing parameters required for determining whether or not a location is in one
of the plurality of tiles;
wherein the first portion is one of a plurality of profiles in one of the plurality of
tiles.

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 6 of 21

Docket: 020101

18. (withdrawn) A method as in claim 17 further comprising:
dividing the Digital Elevation Model into a plurality of areas; and
storing parameters required for determining whether or not a location is in one
of the plurality of areas.

19. (currently amended) A machine readable media containing executable computer
program instructions which when executed by a digital processing system cause said
system to perform a method to retrieve elevation data, the method comprising:
locating a first compressed portion of a Digital Elevation Model (DEM) using a
first index, the Digital Elevation Model comprising a plurality of
compressed portions which are portions of compressed profiles in a first
tile of the Digital Elevation Model, the plurality of compressed portions
stored in one of: a Memory Mapped File (MMF), Random Access
Memory (RAM), and a file in a file system on a digital processing
system, the plurality of compressed portions including which includes
the first compressed portion, the first index pointing to a storage
location where the first compressed portion is stored; [[and]]
decompressing the first compressed portion to retrieve first elevation data for
at least one sample point in the Digital Elevation Model;
identifying the first tile, the first tile containing a first location and being one of
a plurality of tiles in an area of the Digital Elevation Model; and
identifying a first profile that is in the vicinity of the first location, the first
compressed portion being a portion of the first profile.

20. (withdrawn) A media as in claim 19 wherein the plurality of compressed portions
are stored in one of:

- a) a Memory Mapped File (MMF);
- b) Random Access Memory (RAM); and

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 7 of 21

Docket: 020101

c) a file in a file system on a digital processing system.

21. (withdrawn) A media as in claim 20 wherein the plurality of compressed portions are portions of compressed profiles in a first tile of the Digital Elevation Model.

22. (withdrawn) A media as in claim 21 wherein the method further comprises:
identifying the first tile, the first tile containing a first location and being one of a plurality of tiles in an area of the Digital Elevation Model; and
identifying a first profile that is in the vicinity of the first location, the first compressed portion being a portion of the first profile.

23. (withdrawn) A media as in claim 22 wherein the method further comprises:
identifying the area, the area containing the first location and being one of a plurality of areas of the Digital Elevation Model.

24. (original) A media as in claim 19 wherein said decompressing the first compressed portion comprises:

run length decoding the first compressed portion to generate scaled elevation data;
inverse scaling the scaled elevation data to generate normalized elevation data;
and
adding a reference elevation to the normalized elevation data to generate the first elevation data.

25. (original) A media as in claim 19 wherein the method further comprises:
identifying a plurality of sample points in the vicinity of a first location;
retrieving elevations of the plurality of sample points from the Digital Elevation Model; and

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 8 of 21

Docket: 020101

computing an elevation of the first location from an interpolation using the elevations of the plurality of sample points.

26. (original) A media as in claim 25 wherein the method further comprises:
performing a coordinate transformation to express a horizontal position of the first location in a coordinate system used by the Digital Elevation Model.
27. (original) A media as in claim 25 wherein the method further comprises:
providing the elevation of the first location to a Position Determination Entity to perform altitude aiding in a positioning system.
28. (original) A media as in claim 27 wherein said computing the elevation of the first location comprises:
performing a coordinate transformation such that the elevation of first location is expressed in a coordinate system used by the Position Determination Entity.
29. (withdrawn) A machine readable media containing executable computer program instructions which when executed by a digital processing system cause said system to perform a method to store elevation data, the method comprising:
compressing elevation data of a first portion of a Digital Elevation Model (DEM) to generate first compressed elevation data;
storing the first compressed elevation data in a storage location pointed to by a first index; and
storing the first index.

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 9 of 21

Docket: 020101

30. (withdrawn) A media as in claim 29 wherein the method further comprises:
storing parameters required for determining whether or not a location is in the
first portion of the Digital Elevation Model.
31. (withdrawn) A media as in claim 29 wherein the method further comprises:
storing data specifying a coordinate system used to represent the elevation data
of the first portion of the Digital Elevation Model.
32. (withdrawn) A media as in claim 29 wherein said compressing the elevation data of
the first portion comprises:
subtracting a reference elevation from the elevation data of the first portion of
the Digital Elevation Model (DEM) to generate normalized elevation
data; and
scaling the normalized elevation data to generate scaled elevation data.
33. (withdrawn) A media as in claim 32 wherein said compressing the elevation data of
the first portion further comprises:
run length encoding the scaled elevation data to generate the first compressed
elevation data.
34. (withdrawn) A media as in claim 29 wherein the first portion is a profile of the
Digital Elevation Model.
35. (withdrawn) A media as in claim 29 wherein the method further comprises:
dividing an area of the Digital Elevation Model into a plurality of tiles; and
storing parameters required for determining whether or not a location is in one
of the plurality of tiles;
wherein the first portion is one of a plurality of profiles in one of the plurality of
tiles.

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 10 of 21

Docket: 020101

36. (withdrawn) A media as in claim 35 wherein the method further comprises:
dividing the Digital Elevation Model into a plurality of areas; and
storing parameters required for determining whether or not a location is in one
of the plurality of areas.

37. (currently amended) A digital processing system to retrieve elevation data, the
digital processing system comprising:

means for locating a first compressed portion of a Digital Elevation Model
(DEM) using a first index, the Digital Elevation Model comprising a
plurality of compressed portions which are portions of compressed
profiles in a first tile of the Digital Elevation Model, the plurality of
compressed portions stored in one of: a Memory Mapped File (MMF),
Random Access Memory (RAM), and a file in a file system on a digital
processing system, the plurality of compressed portions including which
includes the first compressed portion, the first index pointing to a
storage location where the first compressed portion is stored; [[and]]
means for decompressing the first compressed portion to retrieve first elevation
data for at least one sample point in the Digital Elevation Model;
means for identifying the first tile, the first tile containing a first location and
being one of a plurality of tiles in an area of the Digital Elevation
Model; and
means for identifying a first profile that is in the vicinity of the first location, the
first compressed portion being a portion of the first profile.

38. (withdrawn) A digital processing system as in claim 37 wherein the plurality of
compressed portions are stored in one of:

- a) a Memory Mapped File (MMF);
- b) Random Access Memory (RAM); and

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 11 of 21

Docket: 020101

c) a file in a file system on the digital processing system.

39. (withdrawn) A digital processing system as in claim 38 wherein the plurality of compressed portions are portions of compressed profiles in a first tile of the Digital Elevation Model.

40. (withdrawn) A digital processing system as in claim 39 further comprising:
means for identifying the first tile, the first tile containing a first location and being one of a plurality of tiles in an area of the Digital Elevation Model; and
means for identifying a first profile that is in the vicinity of the first location, the first compressed portion being a portion of the first profile.

41. (withdrawn) A digital processing system as in claim 40 further comprising:
means for identifying the area, the area containing the first location and being one of a plurality of areas of the Digital Elevation Model.

42. (original) A digital processing system as in claim 37 wherein said means for decompressing the first compressed portion comprises:
means for run length decoding the first compressed portion to generate scaled elevation data;
means for inverse scaling the scaled elevation data to generate normalized elevation data; and
means for adding a reference elevation to the normalized elevation data to generate the first elevation data.

43. (original) A digital processing system as in claim 37 further comprising:
means for identifying a plurality of sample points in the vicinity of a first location;

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 12 of 21

Docket: 020101

means for retrieving elevations of the plurality of sample points from the Digital Elevation Model; and
means for computing an elevation of the first location from an interpolation using the elevations of the plurality of sample points.

44. (original) A digital processing system as in claim 43 further comprising:
means for performing a coordinate transformation to express a horizontal position of the first location in a coordinate system used by the Digital Elevation Model.
45. (original) A digital processing system as in claim 43 further comprising:
means for providing the elevation of the first location to a Position Determination Entity to perform altitude aiding in a positioning system.
46. (original) A digital processing system as in claim 45 wherein said means for computing the elevation of the first location comprises:
means for performing a coordinate transformation such that the elevation of first location is expressed in a coordinate system used by the Position Determination Entity.
47. (withdrawn) A digital processing system to store elevation data, the digital processing system comprising:
means for compressing elevation data of a first portion of a Digital Elevation Model (DEM) to generate first compressed elevation data;
means for storing the first compressed elevation data in a storage location pointed to by a first index; and
means for storing the first index.
48. (withdrawn) A digital processing system as in claim 47 further comprising:

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 13 of 21

Docket: 020101

means for storing parameters required for determining whether or not a location is in the first portion of the Digital Elevation Model.

49. (withdrawn) A digital processing system as in claim 47 further comprising:
means for storing data specifying a coordinate system used to represent the elevation data of the first portion of the Digital Elevation Model.

50. (withdrawn) A digital processing system as in claim 47 wherein said means for compressing the elevation data of the first portion comprises:
means for subtracting a reference elevation from the elevation data of the first portion of the Digital Elevation Model (DEM) to generate normalized elevation data; and
means for scaling the normalized elevation data to generate scaled elevation data.

51. (withdrawn) A digital processing system as in claim 50 wherein said means for compressing the elevation data of the first portion further comprises:
means for run length encoding the scaled elevation data to generate the first compressed elevation data.

52. (withdrawn) A digital processing system as in claim 47 wherein the first portion is a profile of the Digital Elevation Model.

53. (withdrawn) A digital processing system as in claim 47 further comprising:
means for dividing an area of the Digital Elevation Model into a plurality of tiles; and
means for storing parameters required for determining whether or not a location is in one of the plurality of tiles;

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 14 of 21

Docket: 020101

wherein the first portion is one of a plurality of profiles in one of the plurality of tiles.

54. (withdrawn) A digital processing system as in claim 53 further comprising:
means for dividing the Digital Elevation Model into a plurality of areas; and
means for storing parameters required for determining whether or not a
location is in one of the plurality of areas.
55. (withdrawn) A machine readable media containing a data stream representing a
Digital Elevation Model, the data stream being produced by a method comprising:
compressing elevation data of a first portion of a Digital Elevation Model
(DEM) to generate first compressed elevation data;
storing the first compressed elevation data in a storage location pointed to by a
first index as part of the data stream; and
storing the first index as part of the data stream.
56. (withdrawn) A media as in claim 55 wherein the method further comprises:
storing parameters required for determining whether or not a location is in the
first portion of the Digital Elevation Model as part of the data stream.
57. (withdrawn) A media as in claim 55 wherein the method further comprises:
storing data specifying a coordinate system used to represent the elevation data
of the first portion of the Digital Elevation Model as part of the data
stream.
58. (withdrawn) A media as in claim 55 wherein said compressing the elevation data of
the first portion comprises:

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 15 of 21

Docket: 020101

subtracting a reference elevation from the elevation data of the first portion of the Digital Elevation Model (DEM) to generate normalized elevation data; and
scaling the normalized elevation data to generate scaled elevation data.

59. (withdrawn) A media as in claim 58 wherein said compressing the elevation data of the first portion further comprises:

run length encoding the scaled elevation data to generate the first compressed elevation data.

60. (new) A method to retrieve elevation data, the method comprising:

locating a first compressed portion of a Digital Elevation Model (DEM) using a first index, the Digital Elevation Model comprising a plurality of compressed portions which are portions of compressed profiles in a first tile of the Digital Elevation Model, the compressed portions stored in one of: a Memory Mapped File (MMF), Random Access Memory (RAM), and a file in a file system on a digital processing system, the plurality of compressed portions including the first compressed portion, the first index pointing to a storage location where the first compressed portion is stored;

decompressing the first compressed portion to retrieve first elevation data for at least one sample point in the Digital Elevation Model;

identifying the first tile, the first tile containing a first location and being one of a plurality of tiles in an area of the Digital Elevation Model;

identifying a first profile that is in the vicinity of the first location, the first compressed portion being a portion of the first profile; and

identifying the area, the area containing the first location and being one of a plurality of areas of the Digital Elevation Model.

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 16 of 21

Docket: 020101

61. (new) A machine readable media containing executable computer program instructions which when executed by a digital processing system cause said system to perform a method to retrieve elevation data, the method comprising:

locating a first compressed portion of a Digital Elevation Model (DEM) using a first index, the Digital Elevation Model comprising a plurality of compressed portions which are portions of compressed profiles in a first tile of the Digital Elevation Model, the plurality of compressed portions stored in one of: a Memory Mapped File (MMF), Random Access Memory (RAM), and a file in a file system on a digital processing system, the plurality of compressed portions including the first compressed portion, the first index pointing to a storage location where the first compressed portion is stored;

decompressing the first compressed portion to retrieve first elevation data for at least one sample point in the Digital Elevation Model;

identifying the first tile, the first tile containing a first location and being one of a plurality of tiles in an area of the Digital Elevation Model;

identifying a first profile that is in the vicinity of the first location, the first compressed portion being a portion of the first profile; and

identifying the area, the area containing the first location and being one of a plurality of areas of the Digital Elevation Model.

62. (new) A digital processing system to retrieve elevation data, the digital processing system comprising:

means for locating a first compressed portion of a Digital Elevation Model (DEM) using a first index, the Digital Elevation Model comprising a plurality of compressed portions which are portions of compressed profiles in a first tile of the Digital Elevation Model, the plurality of compressed portions stored in one of: a Memory Mapped File (MMF), Random Access Memory (RAM), and a file in a file system on a digital

Appl. No. 10/057,189
Amdt. dated 6/1/2005
Reply to Office action of March 9, 2005
page 17 of 21

Docket: 020101

processing system, the plurality of compressed portions including the first compressed portion, the first index pointing to a storage location where the first compressed portion is stored;

means for decompressing the first compressed portion to retrieve first elevation data for at least one sample point in the Digital Elevation Model;

means for identifying the first tile, the first tile containing a first location and being one of a plurality of tiles in an area of the Digital Elevation Model;

means for identifying a first profile that is in the vicinity of the first location, the first compressed portion being a portion of the first profile; and

means for identifying the area, the area containing the first location and being one of a plurality of areas of the Digital Elevation Model.